WHAT IS CLAIMED IS:

1. A signaling server disposed in a telecommunications network, comprising:

a plurality of link shelves, each link shelf including a plurality of line interface cards;

an administrator shelf including circuitry for controlling said plurality of link shelves; and

a system timing generator disposed in said administrator shelf for generating a system clock at a predetermined frequency based a reference input, said system timing generator including circuitry for producing a framed control signal;

at least one level of clock distribution modules coupled to said system timing generator, each clock distribution module receiving said system clock and said framed control signal, wherein at least one clock distribution module comprises a rack-level clock distribution module; and

a plurality of bus control modules coupled to said rack-level clock distribution module, each bus control module interfacing with at least a portion of said line interface cards for at least providing a copy of

said system clock to each of said line interface cards based on said framed control signal.

2. The signaling server disposed in a telecommunications network as set forth in claim 1, wherein said bus control module comprises a decoder circuit for decoding said framed control signal.

3. The signaling server disposed in a telecommunications network as set forth in claim 2, wherein said bus control module comprises means for collecting status signals emanating from said line interface cards and said decoder circuit comprises a Field Programmable Gate Array (FPGA) circuit, and further wherein said status signals are provided to said FPGA circuit as an input for generating a Time Division Multiplexed framed status signal to be transmitted to said rack-level clock distribution module.

4. The signaling server disposed in a telecommunications network as set forth in claim 2, wherein said bus control module comprises a clock selector for selecting a reference clock signal provided by each of said line interface cards controlled by said bus control module, and further wherein said reference clock signal comprises a derived clock signal generated from a telecommunications signal received at one of said line interface cards.

5. The signaling server disposed in a telecommunications network as set forth in claim 2, wherein said bus control module comprises a plurality of Phase Lock Loop (PLL) modules for generating a plurality of clock signals based on one of said system clock and a local time base.

6. A bus control module as a terminal stage in a multi-stage distribution system disposed in a signaling server operating as a Signal Transfer Point in a telecommunications network, comprising:

decoding circuitry to decode a framed control signal received from an upstream stage of said multi-stage distribution system;

a status generator receiving a plurality of status signals from at least one line interface card disposed on a bus segment and controlled by said bus control module, said status generator for encoding said status signals in a predetermined frame of a framed serial status bitstream based on control data obtained from said framed control signal; and

a Phase Lock Loop (PLL) module to lock on an incoming system clock signal received from said upstream stage of said multi-stage distribution system, said PLL module generating a copy of said system clock to be provided to said line interface card.

7. The bus control module as set forth in claim 6, further comprising means to collect a plurality of alarms relating to at least one hardware component disposed in said signaling server, and wherein said alarms are multiplexed into said framed serial status bitstream by said status generator.

8. The bus control module as set forth in claim 7, wherein said hardware component comprises a fan assembly.

9. The bus control module as set forth in claim 7, wherein said hardware component comprises a power supply unit.

10. The bus control module as set forth in claim 7, wherein said hardware component comprises an Ethernet switch.

11. The bus control module as set forth in claim 6, further comprising a reference clock selector for selecting a reference clock signal provided by said line interface card, said reference clock signal comprising a derived clock signal generated from a telecommunications network signal received at said line interface card.

12. The bus control module as set forth in claim 11, wherein said derived clock signal has a frequency of 8 KHz.

13. The bus control module as set forth in claim 11, wherein said telecommunications network signal comprises a DS-0A signal.

14. The bus control module as set forth in claim 11, wherein said telecommunications network signal comprises a Synchronous Optical Network (SONET) signal.

15. The bus control module as set forth in claim 11, wherein said telecommunications network signal comprises a T1 signal.

16. The bus control module as set forth in claim 11, wherein said telecommunications network signal comprises an E1 signal.

17. The bus control module as set forth in claim 6, further comprising a local time base operating as a standby clock source when said incoming system clock signal received from said upstream stage of said multi-stage distribution system is defective.

18. The bus control module as set forth in claim 6, wherein said bus segment comprises a Compact Peripheral Component Interconnect (CPCI) bus segment.

19. A bus control module disposed as a stage in a multi-stage distribution system, comprising:

means for decoding a framed control signal received from an upstream stage of said multi-stage distribution system; and

means for generating a framed serial status bitstream based on control data obtained from said framed control signal, said framed serial bitstream including status data from a plurality of line interface cards disposed on a bus segment and controlled by said bus control module, wherein said framed serial status bitstream is provided to said upstream stage in a predetermined frame order.

20. The bus control module disposed as a stage in a multi-stage distribution system as set forth in claim 19, further comprising means for distributing a copy of an incoming system clock signal received from said upstream stage to each of said line interface cards.

21. The bus control module disposed as a stage in a multi-stage distribution system as set forth in claim 19, further comprising means for selecting a reference clock from a plurality of reference clocks provided by said line interface cards.

22. A bus control module disposed as a stage in a multi-stage distribution system, comprising:

means for decoding a framed control signal received from an upstream stage of said multi-stage distribution system; and

means for distributing a copy of an incoming system clock signal received from said upstream stage to a plurality of line interface cards disposed on a bus segment and controlled by said bus control module.

23. The bus control module disposed as a stage in a multi-stage distribution system as set forth in claim 22, further comprising means for generating a framed serial status bitstream based on control data obtained from said framed control signal, said framed serial bitstream including status data from said line interface cards, wherein said framed serial status bitstream is provided to said upstream stage in a predetermined frame order.

24. The bus control module disposed as a stage in a multi-stage distribution system as set forth in claim 22, further comprising means for selecting a reference clock from a plurality of reference clocks provided by said line interface cards.